AROTAL - A DC-8 Lidar

Airborne Raman **O**zone Temperature and Aerosol Lidar

Goddard Participants

- **Walt Hoegy, Don Silbert, Bill Heaps, John Burris**
  - ***NASA GSFC***
- **Grant Sumnicht - *SSAI***
- **Laurence Twigg - *SSAI***

Langley Participants

- **Chris Hostetler, John Hair**
  - *NASA LARC*
- **Gary Hansen, Patricia Lucker**
  - ***Science and Technology Corp.***
- **Mary Osborne - *SAIC***

Data Products

- Ozone - From 1 km above plane to ~ 30 km; 1-3 minute integration; 40 km with more integration
- Temperature - 1 km above plane to ~ 60 km; 1 minute integration (SZA >95°)
- Aerosol Backscatter, Extinction at 355/387 (SZA > 95°) nm; Near plane to ~30 km; 1 minute integration (SZA > 95°)

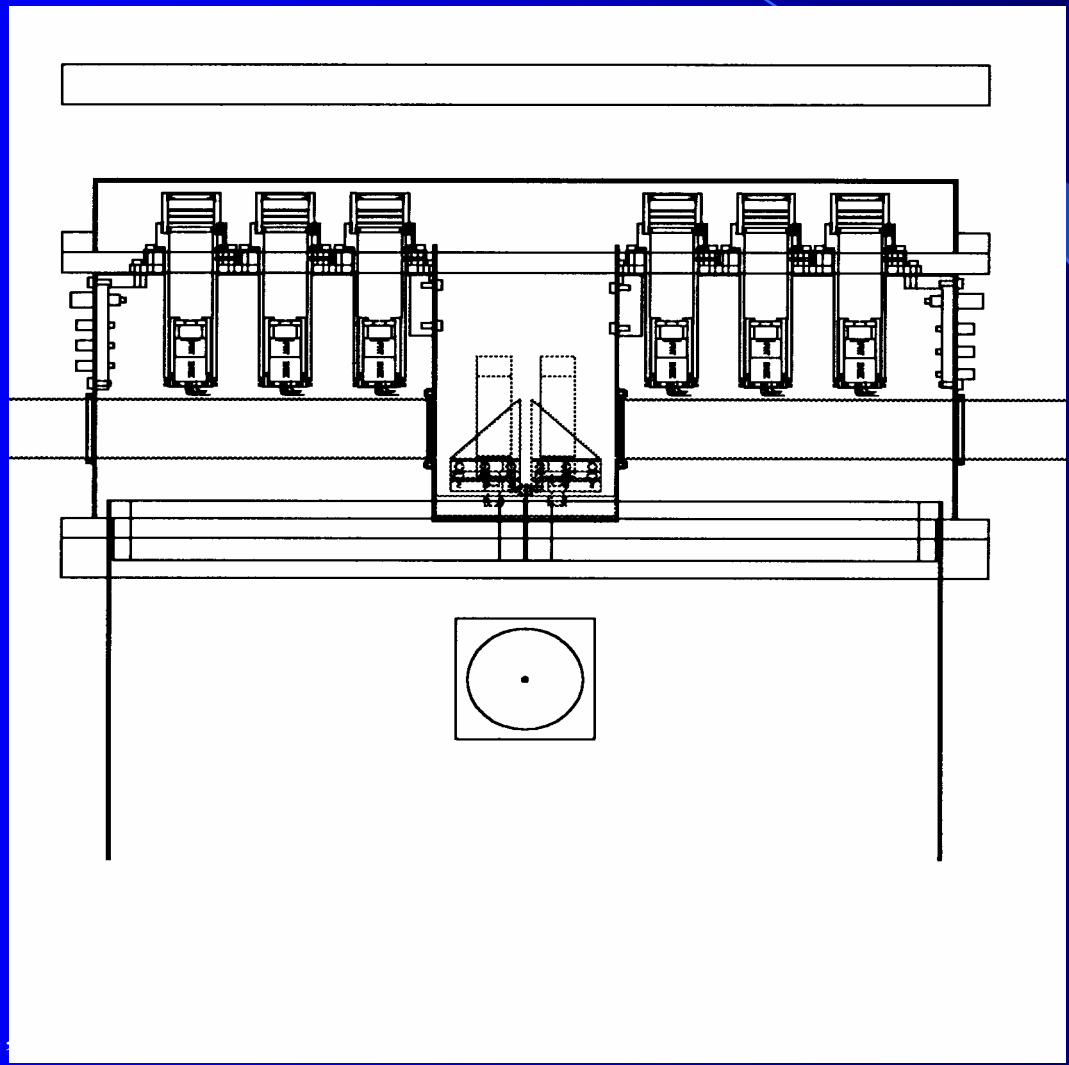
Instrumentation

- Four Transmitted Wavelengths: 308, 355, 532 and 1064 nm
- Six Detected Wavelengths: 308, 332, 355, 382, 532 and 1064 nm
- Multiple Detectors per Wavelength
- Photon Counting and Analog Detection

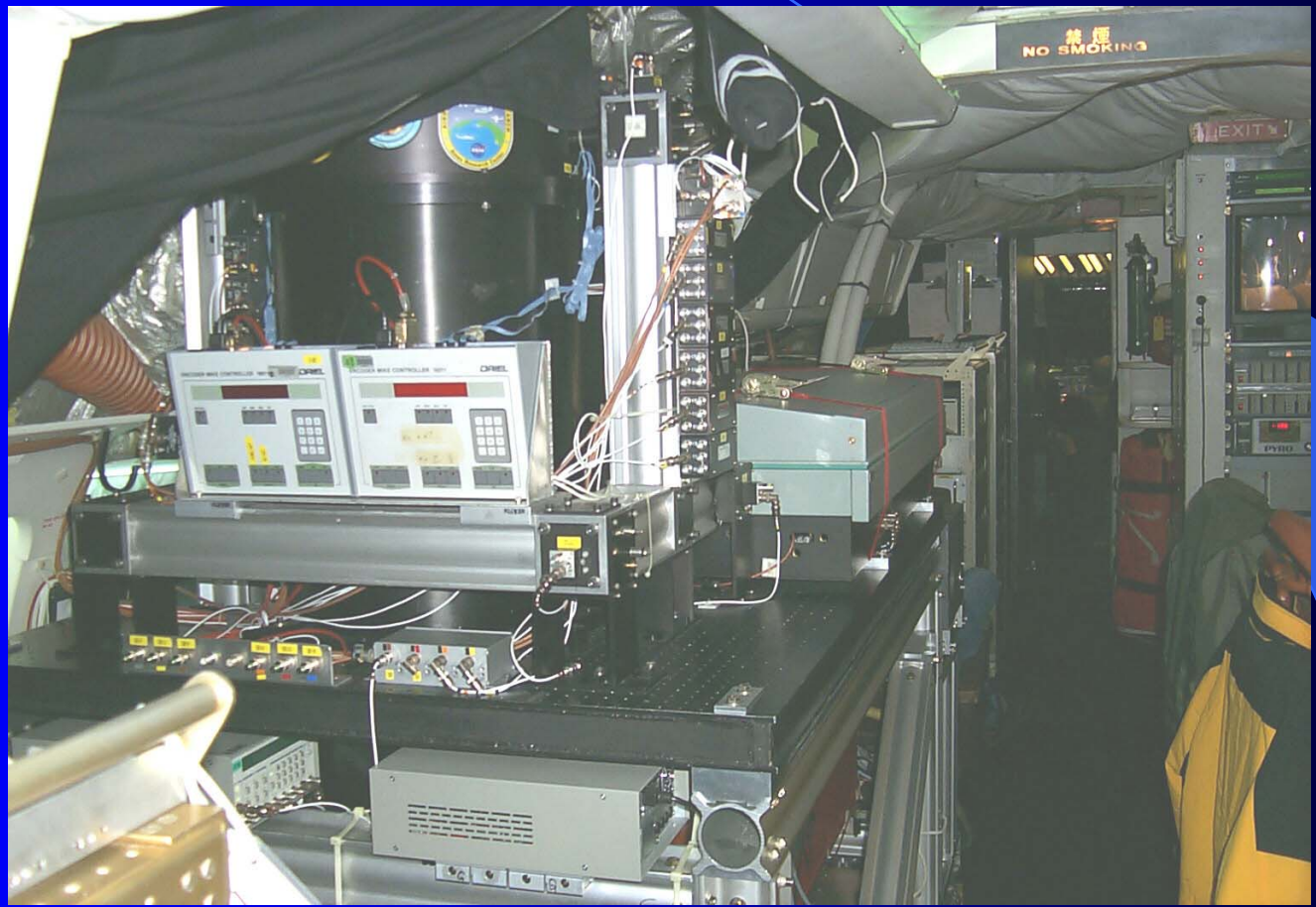
Instrumentation (Cont.)

- 16” (40.6 cm) Primary Telescope
- Six 1” mini - receivers for near field detection
- Gated Hamamatsu R7400 PMTs
- 50Hz 1.2J Nd-YAG; 200 Hz, .22J XeCl

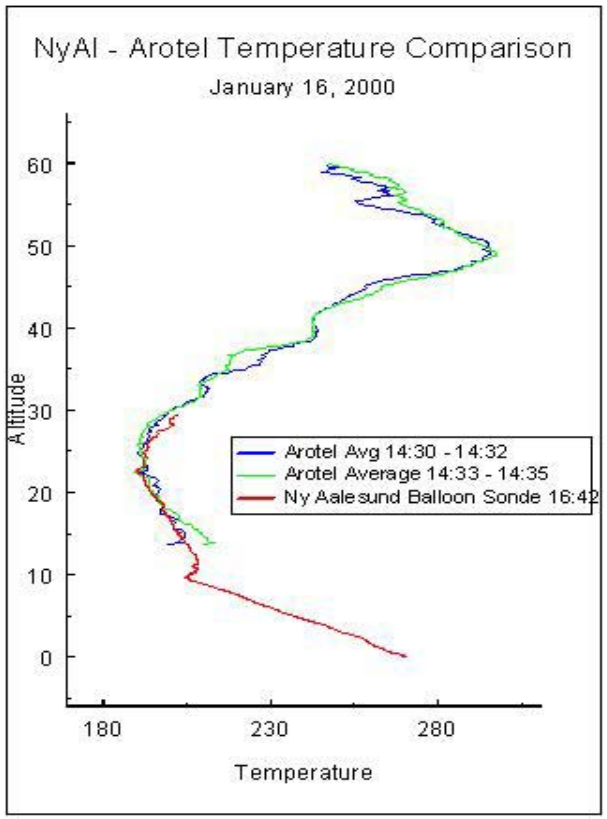
AROTEL Mini Receivers

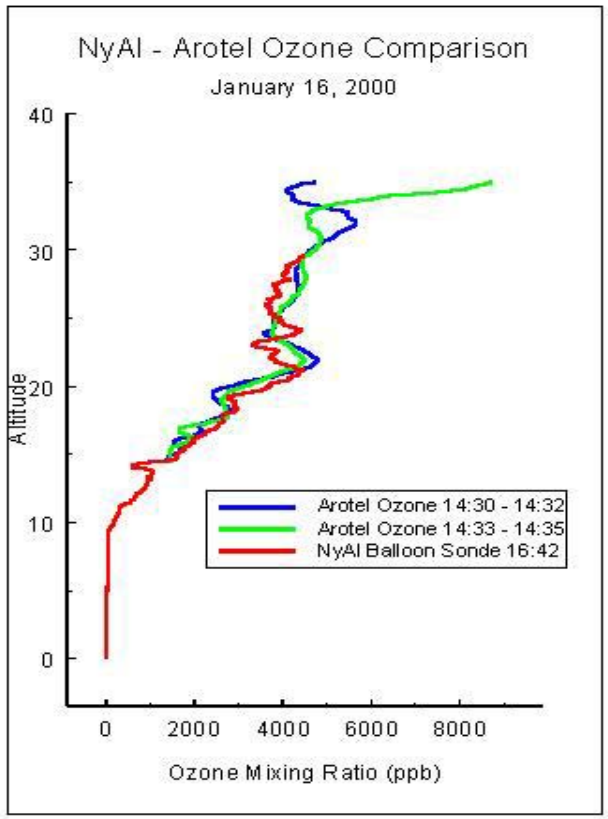


AROTEL on DC-8

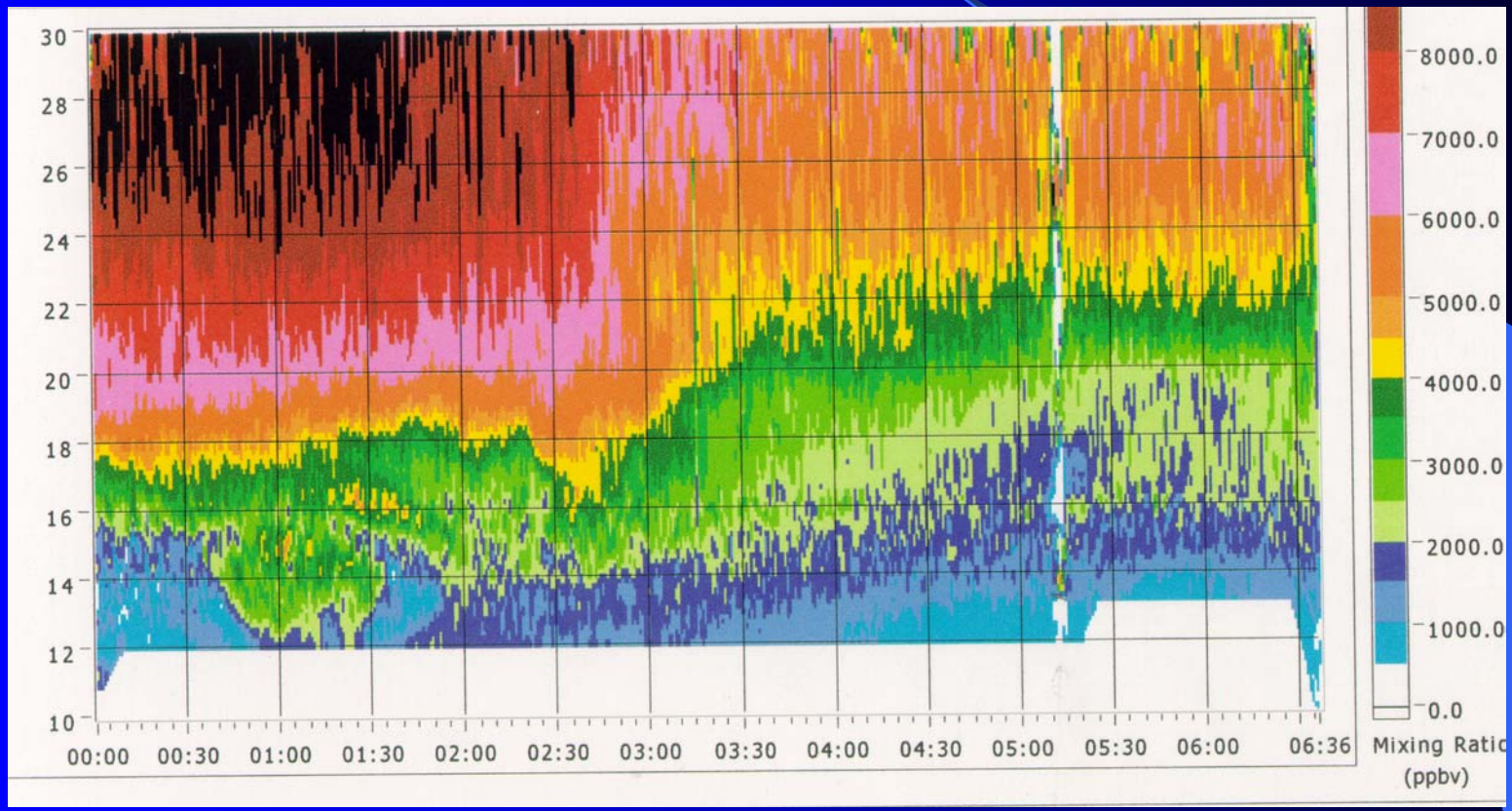


Arotel - Ny Aalesund Comp

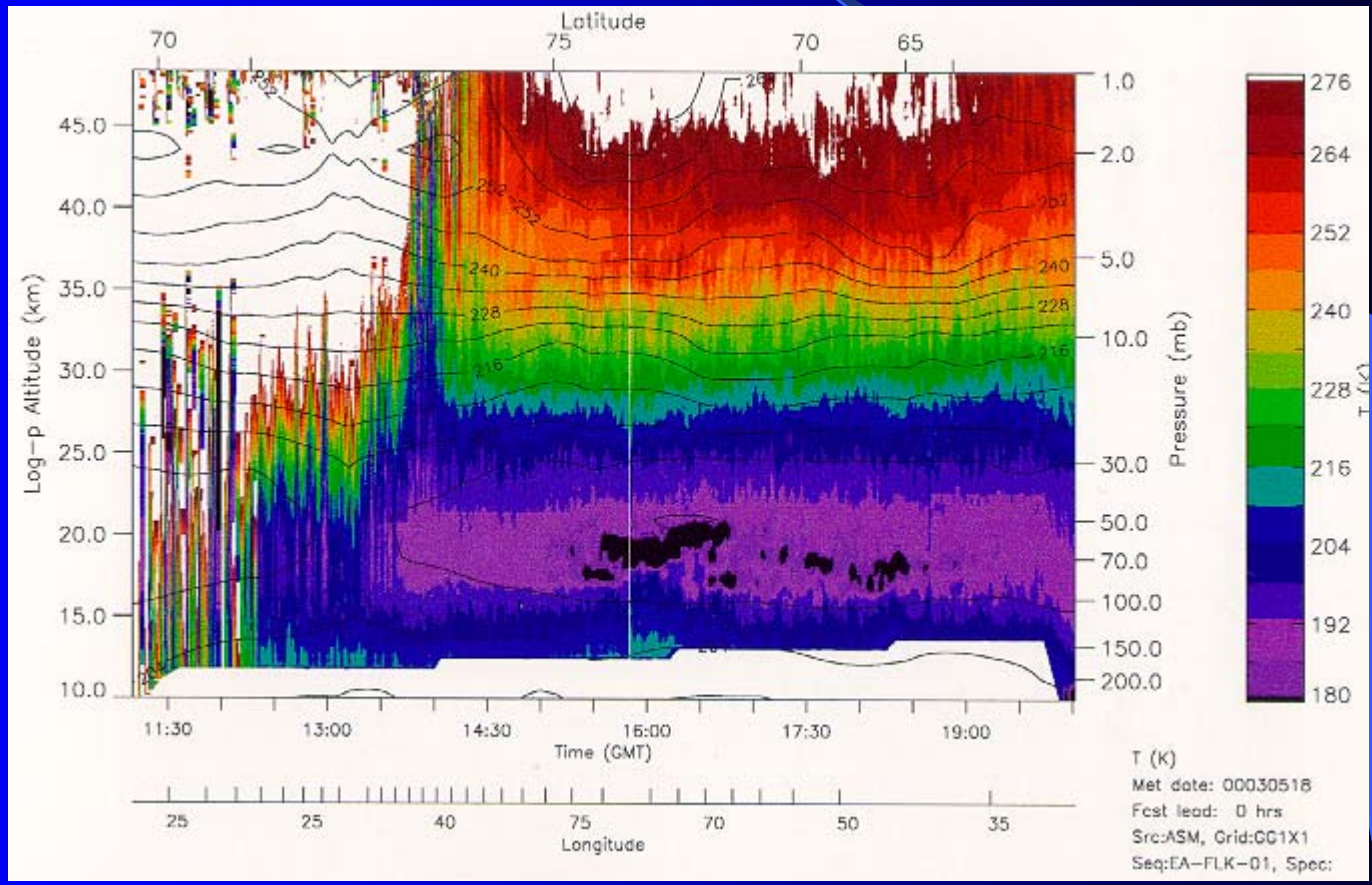




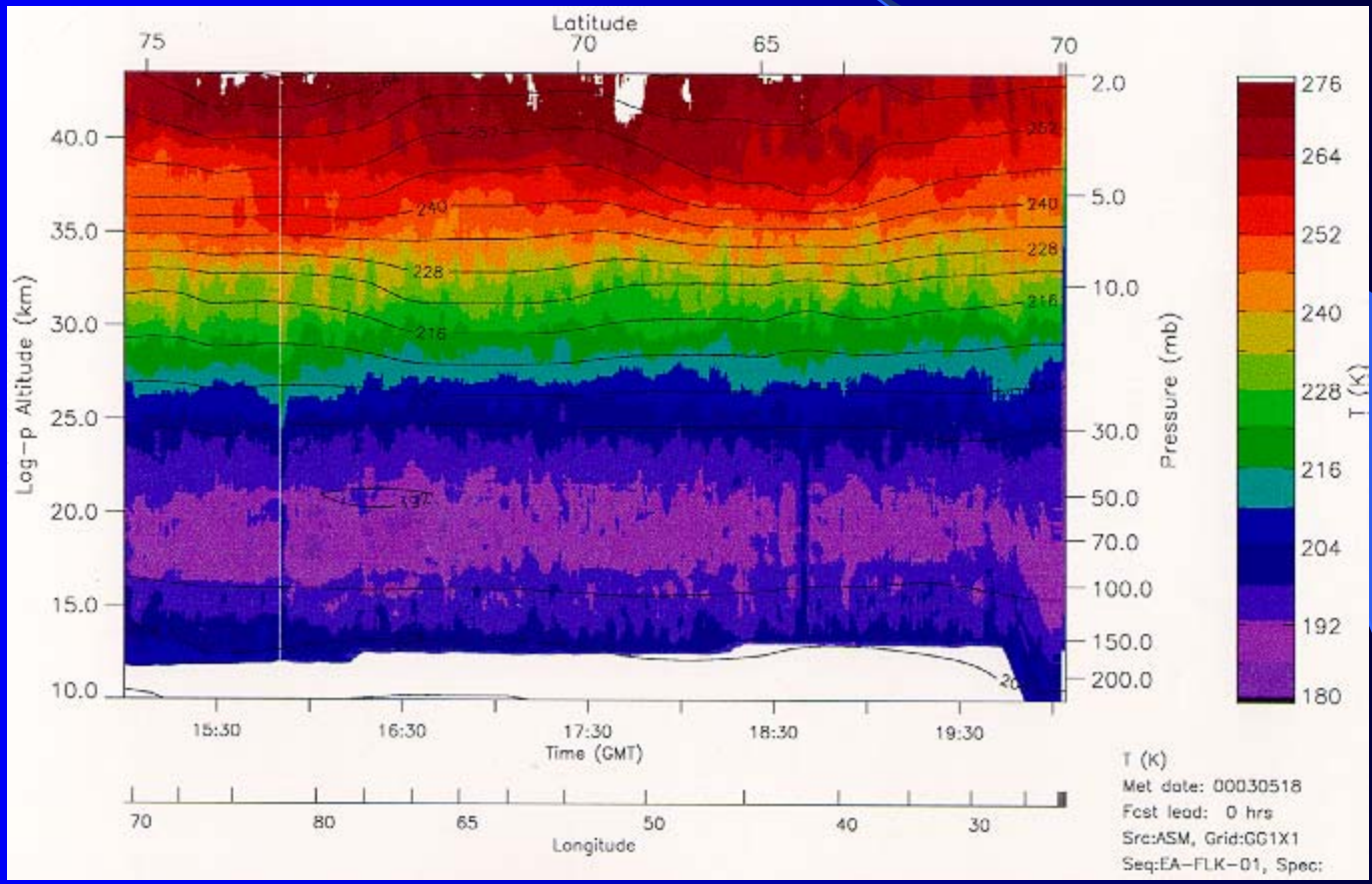
AROTAL Ozone - 2/28/2000



AROTEL Rayleigh Temp 3/5



AROTEL Raman Temp 3/5



SOLVE 2 Improvements

- Mechanical Chopper
  - Blocks return from outgoing beams for 2 km
- Improved PMT Gating Circuitry
  - Better linearity
- More Dynamic Range near plane
  - Better linearity
- Substantial Algorithm Development

Benefits to SAGE III

- Vertical profiles of three SAGE III parameters
- Can average along the satellite footprint to provide high SNR profiles
- Standard profiles provide variability within the satellite footprint